

Data Assimilation of AIRS water vapor profiles: Impact on Precipitation Forecasts for Atmospheric River Cases Affecting the Western of the United States

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Atmospheric rivers are transient, narrow regions in the atmosphere responsible for the transport of large amounts of water vapor. These phenomena can have a large impact on precipitation. In particular, they can be responsible for intense rain events on the western coast of North America during the winter season. This paper focuses on attempts to improve forecasts of heavy precipitation events in the Western US due to atmospheric rivers. Profiles of water vapor derived from from Atmospheric Infrared Sounder (AIRS) observations are combined with GFS forecasts by a three-dimensional variational data assimilation in the Gridpoint Statistical Interpolation (GSI). Weather Research and Forecasting (WRF) forecasts initialized from the combined field are compared to forecasts initialized from the GFS forecast only for 3 test cases in the winter of 2011. Results will be presented showing the impact of the AIRS profile data on water vapor and temperature fields, and on the resultant precipitation forecasts.